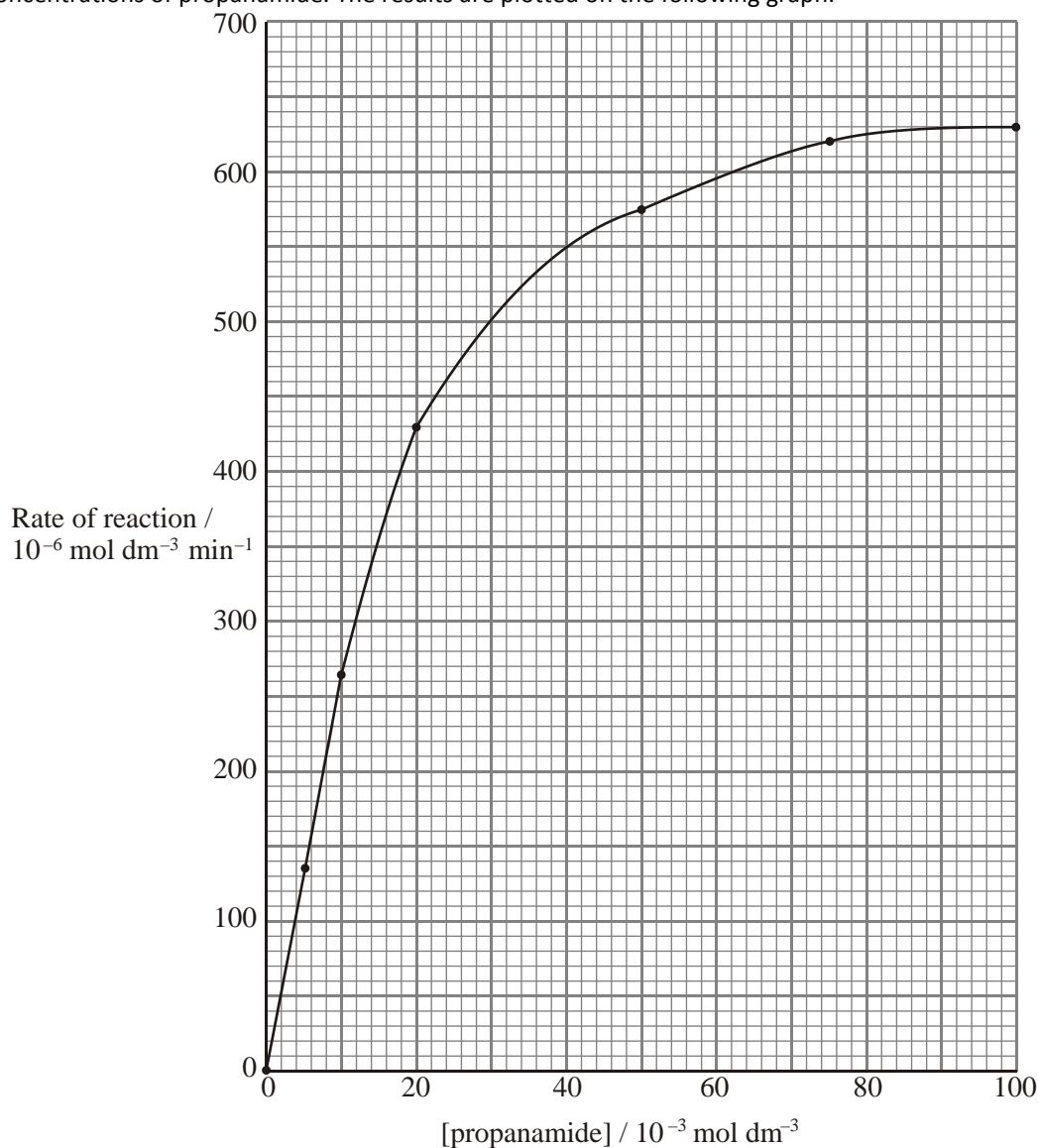


TBD07 – IB HL Question Review #1

Name.....

1. Propanamide is hydrolysed to propanoic acid and ammonia by an enzyme. The rate of this reaction was measured at different concentrations of propanamide. The results are plotted on the following graph.



- (a) Explain how an enzyme, E, can increase the rate of a reaction of a substrate, S, to form a product, P.

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(2)

- (b) (i) Explain the shape of the curve on the previous page.

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(4)

- (ii) Determine the maximum rate, V_{max} , and the Michaelis constant, K_{m} , using the graph.

V_{max} K_{m}

(2)

2. (a) Explain, with reference to the active site, how enzymes are able to catalyse biological reactions.

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(3)

- (b) State and explain the effect on the rate of an enzyme-catalysed reaction of gradually increasing the temperature from 10°C to 60°C.

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(4)

(Total 7 marks)

3. Genetic information is stored in chromosomes which contain a very long DNA sequence.

- (a) (i) A nucleotide of DNA contains deoxyribose, a phosphate group and an organic base. Outline how nucleotides are linked together to form polynucleotides.

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(2)

- (ii) Describe the bonding between the two strands in the double helical structure of DNA.

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- (b) Explain how the sequence of different bases in DNA is related to the genetic information carried in the chromosomes.

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(2)

- (c) Describe how a DNA profile can be obtained from a sample of blood taken from a child and explain how it could be used to prove whether or not a particular adult is the child's parent.

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(4)

(Total 10 marks)

4. Enzymes are important molecules in the chemistry of living organisms.

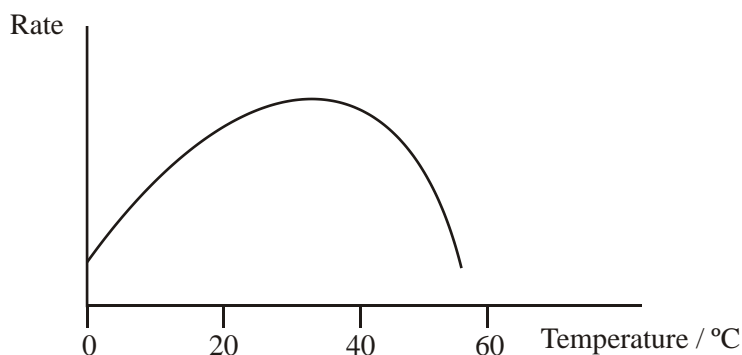
(a) State what type of molecule an enzyme is and state the function of enzymes.

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(2)

(b) Explain the shape of the following graph for a reaction involving an enzyme.

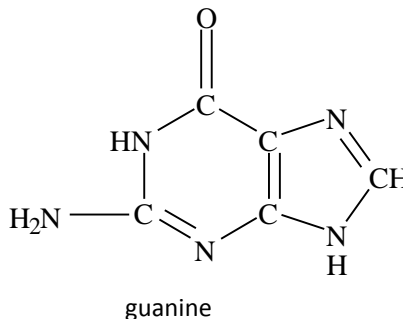
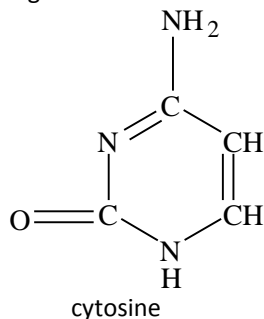
(4)



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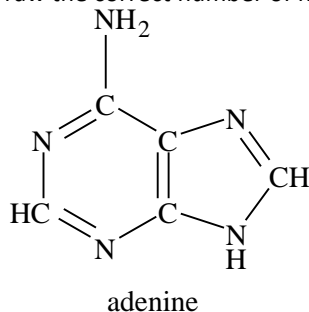
(Total 6 marks)

5. (a) The structural formulas of cytosine and guanine present in nucleic acids are given below. Draw the correct number of hydrogen bonds between these two bases.



(2)

(b) The structural formula of adenine is shown below. Copy an appropriate base from the Data Booklet present in RNA that will pair with adenine. Draw the correct number of hydrogen bonds between these two bases.



(2)

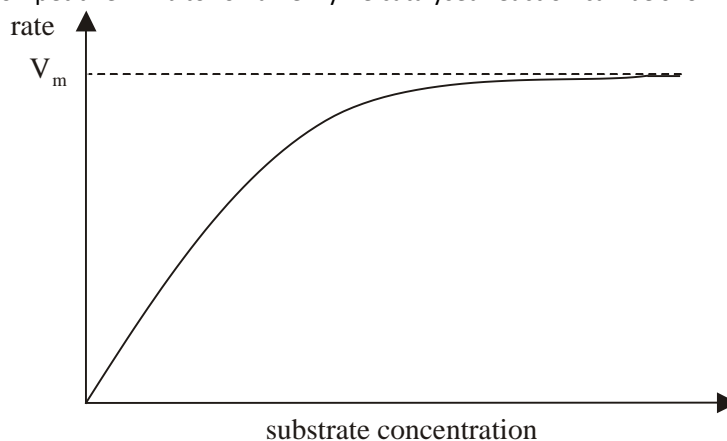
(Total 4 marks)

6. (a) Discuss the effect of a competitive inhibitor on an enzyme catalysed reaction.

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(4)

- (b) The effect of a competitive inhibitor on an enzyme catalysed reaction can be shown on the graph below.



Annotate the graph to show the position of K_m for the reaction. Draw a line on the graph to represent the effect of competitive inhibition.

(2)

(Total 6 marks)

7. Describe aerobic respiration of glucose in the human body, with reference to oxidation and

reduction.

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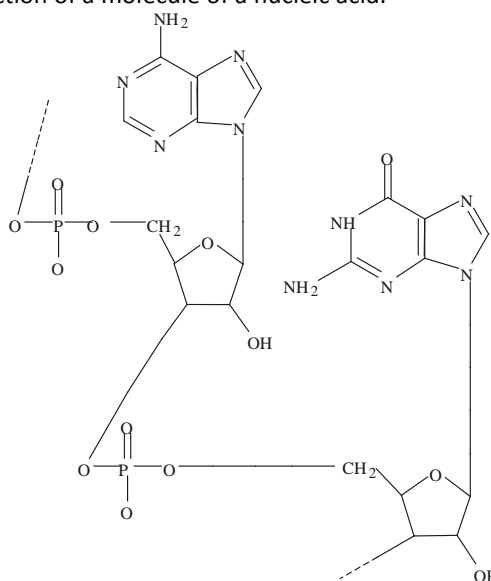
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(Total 4 marks)

8. The following drawing shows a section of a molecule of a nucleic acid.



- (a) Identify the part of the nucleic acid that represents one nucleotide, by enclosing it within a ring and labelling it as "nucleotide".

(1)

- (b) For a different nucleotide in the nucleic acid molecule, identify its three parts, by circling each one and labelling it with an appropriate name.

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(3)

(Total 4 marks)